Maryland Department of Environment

Water and Science Administration
Compliance Program
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Inspector: Wendy Huang
AI ID: 3076

Site Name: Patapsco WWTP
Facility Address: 3501 Asiatic Ave, Curtis Bay, MD 21226
County: Baltimore City

Start Date/Time: June 15, 2023, 09:00 AM
End Date /Time: June 15, 2023, 02:00 PM

Media Type(s): NPDES Municipal Major Surface Water, NPDES Industrial Stormwater

Contact(s):
Neal Jackson- Plant Manager of Patapsco WWTP
Andrea Buie- Branam- Environmental Compliance Manager of Baltimore City
Eric Johnson- Wastewater Operations Supervisor of Patapsco WWTP
Kevin Mc Fadden- Operation Supervisor II of Patapsco WWTP
Donald Taylor- ENR Supervisor of Patapsco WWTP
Chris Saunders- Senior Associate of Hazen & Sawyers
Sajid Roomi- Engineer for Patapsco WWTP
Chris Lepadatu- MDE Regulatory Compliance Engineer

NPDES Municipal Major Surface Water/ NPDES Industrial Stormwater

Permit / Approval Numbers: 15DP0580/ 12SW0629
NPDES Numbers: MD0021601/ MDR000629
Inspection Reason: Follow-up (Non-Compliance)
Site Status: Active
Compliance Status: Noncompliance
Recommended Action: Continue Routine Inspection
Evidence Collected: Photos or Videos Taken, Record Review, Visual Observation
Delivery Method: Email
Weather: Partly cloudy and not raining

Inspection Findings:
An inspection was conducted on this day at the Patapsco Wastewater Treatment Plant (WWTP). The receiving water is the Patapsco River and is designated as Use II waters protected for estuarine and marine aquatic life. MDE representatives met with the above-listed contacts during the time of this inspection. The Patapsco WWTP is a 73 MGD capacity activated sludge wastewater treatment plant with ferric chloride for removal of phosphorus. Mr. Chris Saunders provided an overview of this wastewater treatment plant.

Industrial Plant Influent Low Level Interceptor (IPI)
The pump and blower/ IPI building has two bar screens. Bar screen #1 was turned off during the time of this inspection. The bar screens operate on a rotating basis. Industrial influent enters the wastewater treatment plant via this building. This building has approximately 2-3 MGD capacity for industrial influent. A hose that is leaking water is

placed on a puddle of water outdoor, by the west side of the IPI building. Mr. Neal Jackson stated the hose was turned on to remove the accumulated rags on the bar screens in the IPI building. Water from the hose was not observed to be flowing into nearby storm drains. BAF media was observed on both bar screens within the IPI building. A picture of the leaking hose is shown below:

The hose should be fixed to ensure that it is not leaking.

Combined Influent Building:
Domestic sewage and industrial influent enter this building. Grease and grit are removed from sewage with fine screens. The solids are then dropped onto the conveyor belts where they will be transported into dumpsters. Grease and grit in the dumpsters are then placed in the transfer station for dewatering. Mr. Chris Saunders stated all eight fine screens are operational. During the time of this inspection, fine screen #3 is turned off and seven other fine screens are currently in running. Grits were observed on the ground by the output side of fine screens # 5-8. A picture of the ground by the output side of fine screen #5-8 is shown next page.

There is less grit on the ground by the output side of fine screens #1-4. A picture of the ground surface by the output side of fine screen #1-4 is shown below:

A staff member of the Patapsco WWTP is mopping the floor within the combined influent building. The conveyors are running but there is grit that is stuck to the rollers under the conveyor belt.

Transfer Station:

Grease and grit are stored in the transfer station. The transfer station has a roof, walls on three sides, and trench drains on the ground. Liquids from the grit flow into the trench drain and back into the gravity sludge thickener (GST). Dried grit that is currently stored at the transfer station will be taken to the Quarantine Road Municipal Landfill for disposal. Grease tracks and some media were observed outdoor on the ground surface by the transfer station. BAF media was observed within the trench drains within the transfer station. I expressed concern about possible drain clog within the transfer station. After the site walk through, Mr. Eric Johnson stated that grit is being removed from the transfer station, the transfer station will be cleaned after all grit is removed by the night of 6/15/2023/ no later than 6/16/2023, and the trench drains will be cleaned of debris and BAF media. A picture of a trench drain inside the transfer station (at the loading/ unloading area) is shown below:

A picture of the inside of the transfer station is shown below:

GSTs:
The facility has three GSTs (GSTs #1, 2, and 4). All GSTs were inspected. At the time of this inspection, water was being sprayed on the water surface of GSTs #1 and 2. GSTs # 1 and 2 had an accumulation of sludge at the surface of the GSTs and outside of the V- notch weirs. Mr. Chris Saunders stated that according to Synagro (the facility that processes sludge for Patapsco WWTP), the facility was down for a day and cannot pick up solids from both GSTs due to both drying trains being malfunctioned. During the time of the inspection at the GSTs, Mr. Chris Saunders stated that he received news that all drying trains at Synagro are running again.

GST #4 is continuously receiving high pressure effluent water and is idle. Grime was observed at the outer weir of the GST. Mr. Chris Saunders does not know the exact date of when GST #4 will run. A picture of GST #4 is shown next page:

Primary Settling Tanks (PSTs):
Mr. Chris Saunders and Mr. Neal Jackson stated that all PSTs are functional. PSTs #1-3 are turned off, with no wastewater entering and leaving the PSTs. PSTs #4-6 are running. BAF media was not observed at the inflow and outflow side of the PSTs during the time of this inspection. FOGs and foam are being intercepted by troughs before wastewater flow out of the PST and to the pure oxygen reactors. Mr. Chris Saunders stated that FOGs will be drained back to the IPI channel.

Pure Oxygen Reactors and Liquid Oxygen Plant (LOX Plant):
The LOX plant converts air to 95% liquid oxygen. Liquid oxygen will then be used for the pure oxygen reactors for BOD removal. The main system at the LOX Plant is currently running.

The facility has six pure oxygen reactors. The inside of the reactors cannot be observed. Mr. Chris Saunders stated the following in regard to the pure oxygen reactors:

- Reactors #2, 3, 5, and 6 are running during the time of this inspection. Reactors #1 and 4 are not running but are functional.
- Each reactor has three aerators and are functional (twelve aerators running during the time of the inspection). Aerators in all reactors are functional.
- The facility has six spare aerators. Four out of six aerators are on standby and functional. The remaining two spare aerators are in the process of being rebuilt.

Secondary Clarifiers:
The facility has eight clarifiers. Inspection of all eight clarifiers (Clarifiers # 1- 4, 5A, 5B, 6A, and 6B) was conducted. The surfaces of the clarifiers that are in operation were being sprayed with water to further break up the scum. Clarifier #3 was not operational and was being used as a mud well to contain backwash water from the denitrification filters and biological activated filters (BAFs). Wastewater from Clarifier #3 flows back into the PST. Clarifier #2 is not running. There are solids and BAF media within Clarifier #2. Ensure that all solids and BAF media are removed before turning on Clarifier #2. During the time of this inspection, Clarifiers #1, 4, 5A, 5B, 6A, and 6B are running. A picture of Clarifier #2 is shown next page:

Duckweed was observed on the water surface between two launder covers within Clarifier #1 but did not cause an obstruction in water flowing out of the V- notch weir. All clarifier arms in Clarifier # 1 and 6A have been fixed and are functional. A picture of Clarifier #1 is shown below:

A picture of Clarifier # 6A is shown below:

One out of two clarifier arms within Clarifiers #4, 5A, 5B, and 6B are functional per design.

BAFs and mud wells:

All BAF cells were active, with air being injected into the water for nitrification and BOD removal. The BAF has 24 individual cells. Mr. Chris Saunders showed me the monitoring device for BAF effluent, with ammonia concentration of 0.10 mg/L and phosphate concentration of <0.05 mg/L. Mud wells #1 and 2 were inspected and foam was observed on the water surface in both mud wells. FOGs and BAF media were not observed on the water surface within both mud wells. A picture of mudwell #2 is shown next page. During the time of this inspection, water was observed to be flowing into mudwell #2. Mr. Chris Saunders characterized the inflow as backwash water from the BAF.

A picture of mudwell #1 is shown below:

Denitrification Filters:

The denitrification system has 34 individual filters. Mr. Donald Taylor provided the operation status of all denitrification filters during the time of the inspection. During the time of this inspection, filters # 1, 4-6, 20, 27, 29, 30, 33, 34 are not in service. Mr. Donald Taylor stated the following regarding the denitrification filters:

- Filters # 4, 5, 29, and 30 were turned off for maintenance so that the filters can be dried to prevent the accumulation of algae and to allow for the filter to operate smoothly.

- Filters # 1, 6, 20, 27, 33, and 34 are not operational due to the need for mechanical repair.

- Maintenance of filters # 2 and 3 have been completed recently and are currently running.

Water enters the denitrification filters from the top after overflowing the concrete weir walls. FOGs and BAF media were not observed in all denitrification filters. Water then exits the denitrification filters by flowing through the sand filter. Sand filters are located at the bottom of each individual denitrification filters. The denitrification filters are automatically backwashed every four hours for approximately 46 minutes. Water surface is above the top of the concrete weir walls at filters # 10, 19, 21, and 31 and these filters are preparing to be backwashed. Filters #4, 5, 29, and 30 are full of algae.

<u>Chlorine contact chambers:</u>
The wastewater treatment plant has four chlorine contact chamber units, which were all running at the time of this inspection. As an amendment to the previous inspection reports dated 4/27/2023 regarding the “fifth chlorine contact chamber that is currently not functional but may run in the future”:

- The fifth chlorine contact chamber was not constructed but may be constructed in the future.
- A grass area by the south side of chlorine contact chamber #4 is the proposed location for chlorine contact chamber #5 and if chlorine contact chamber #5 is to operate, a wall between chlorine contact chambers #4 and proposed chlorine contact chamber #5 would be removed.

Some media from the BAF cells were observed on the wall within all chlorine contact chambers but are being contained by containment booms or being caught by troughs. The troughs in each chlorine contact chamber are turned one at a time with a push of a button to allow foams and media to enter the troughs. Mr. Eric Johnson and Mr. Neal Jackson asked if the containment booms can be removed from the chlorine contact chambers. Mr. Eric Johnson stated that the booms are placed in front of troughs, within the chlorine contact chamber as a recommendation from Ron Wicks to prevent foam and media from leaving the site at the outfall while the scum troughs were malfunctioned. Because all the scum troughs are currently working, Baltimore City is hoping to receive permission in writing to remove these booms. <u>In response to the removal of the booms: the booms should be placed behind the troughs within the chlorine contact chambers instead of in front of the troughs as extra protection to prevent potential media and FOGs that cannot be entirely captured by the troughs from leaving the site.</u>

Clear effluent was observed to be flowing off site and to the Patapsco River. Media and FOGs were not observed to be leaving the site.

<u>Self-Monitoring/ In-House Lab:</u>
The following records were reviewed:

- daily pH calibration records for 4/28/2023 to 6/15/2023
- daily zero oxygen verification/ dissolved oxygen (DO) calibration for 4/28/2023 to 6/15/2023
- daily composite samplers’ temperatures for 6/1/2023 to 6/22/2023
- total residual chlorine standards reading/ verification for 4/28/2023 to 6/15/2023.

Hard copies of the daily pH calibration records, DO calibration records, and total residual chlorine standards reading/ verification for April and May 2023 were provided by Mr. Eric Johnson.

pH calibrations are conducted at least 3 times each day. A zero-oxygen standard is used each time for DO calibrations. The DO concentration for 5/28/2023 is missing for the zero-oxygen verification log. During the above referenced time period for the zero-oxygen verification, the DO concentration for the standard was less than 0.5 mg/L, which is acceptable. The facility’s operator lab for the outfall has two composite samplers and a spare refrigerator to store samples. The temperatures of composite samplers # 1 and 2 were 4.5°C and 5.75°C, respectively. The temperature of the spare refrigerator was -1°C. The composite samplers and spare refrigerator were less than 6°C and were within the temperature requirement for sample holding/ preservation, according to Table II in CFR 136.3.

The total residual chlorine concentrations of the standards taken by the chlorine meter were out of range when compared to the total residual chlorine numbers noted on the standards' label for multiple days between 4/28/2023 and 6/12/2023. The table below shows the comparison of total residual chlorine concentrations of the standards between the readings taken by the meter and numbers noted on the label and the difference between the two numbers for some of the days between 4/28/2023 and 6/12/2023:

Date	Chlorine concentration of standards according to label	Chlorine concentrations taken by the meter	Difference between the label and readings taken by the meter
4/28/2023	1.0±0.03 mg/L	0.95 mg/L	-0.05
4/28/2023	2.5±0.1 mg/L	2.8 mg/L	+0.3
4/29/2023	1.0±0.03 mg/L	0.96 mg/L	-0.04
4/30/2023	1.0±0.03 mg/L	0.95 mg/L	-0.05
5/7/2023	1.0±0.03 mg/L	0.96 mg/L	-0.04
6/2/2023	1.0±0.03 mg/L	0.96 mg/L	-0.04
6/3/2023	1.0±0.03 mg/L	0.96 mg/L	-0.04

I inquired the reason for the above referenced out of range total residual chlorine readings. Following up on the previous inspection report dated 4/27/2023, regarding the La Motte chlorine meter at the facility's operator lab is taken to the Patapsco lab once a day to verify the accuracy of the meter by using primary standards of known chlorine concentration, Ms. Andrea Buie- Branam stated that she had the impression that this was the case, but the Patapsco lab created the standards once and was not able to create the standards each day due to being short on supply. Ms. Andrea Buie- Branam stated that starting 6/12/2023, the operator lab begins creating the primary standards each day by diluting the solution from NSI Lab Solutions with known concentrations of total residual chlorine. The operator lab dilutes three types of solutions with three of the following different concentrations noted on the label:

- 100±0.544 ug/L, with acceptable limits of 40.0 to 160 ug/L
- 1.00±0.005 mg/L, with acceptable limits of 0.746 to 1.20 mg/L
- 2.56±0.012 mg/L, with acceptable limits of 1.88 to 2.98 mg/L

The 100 ug/L and 1.00 mg/L solutions will expire on 8/31/2024. The 2.5 mg/L solution will expire on 10/31/2024. The chlorine concentration taken by the meter on 6/12/2023 for the 100 ug/L standard is 0.18 mg/L or 180 ug/L and is out of range. Ms. Andrea Buie- Branam stated the reason for this out-of-range reading is operator error. Total residual chlorine concentrations for other days using the NSI Lab solutions are within range as noted on the label. Mr. Kevin McFadden also showed me a certificate showing the LaMotte meter is operating satisfactorily.

<u>Lab reports, MORs, and DMRs:</u>
Lab reports and the MOR for April 2023 were sent to me via email by Mr. Robert Lombardi (Wastewater Division Operations Engineer of Patapsco WWTP). Lab results for 5- day biological oxygen demand (BOD), total suspended solids (TSS), ammonia, nitrate plus nitrite, total phosphorus (TP), ortho- phosphate, Enterococci, cyanide, and metals were reviewed. Calculation discrepancies/ reporting for nutrients, metals, *Enterococci*, TSS, BOD, pH, total residual chlorine, cyanide, and flow were not observed on netDMR.

Sample temperature is missing from the chain of custody sheet for nutrients, BOD, TSS, and *Enterococci* for 4/28/2023. Mr. Robert Lombardi provided me a chain of custody form dated 4/28/2023 with handwritten temperatures of composite samplers #1 and 2 and the spare fridge via email on 6/23/2023. The chain of custody form noted the temperatures for composite samplers #1 and 2 to be 4.0°C and 3.5°C, respectively and for the spare fridge to be 3.5°C. The temperatures of both composite samplers and fridge are below 6°C and within the requirement for sample holding/ preservation, according to Table II in CFR 136.3 thus, lab results dated 4/28/2023 are acceptable.

Following up on the previous inspection report dated 4/27/2023, weekly average minimum DO concentration for March 2023 of 10.2 mg/L (instead of 10.1mg/L) have been corrected on netDMR. Weekly average minimum DO concentration for March and April 2023 have been corrected on netDMR on 6/8/2023. Weekly average minimum DO concentration was calculated in accordance with Definitions H.2 of this permit.

The lab report for effluent sampled on 4/7/2023 noted the holding time between sample collection time and analysis time is over 48 hours for BOD analysis, according to 40CFR 136.3 Table II. Effluent was collected on 4/7/2023 at 23:59 and was analyzed on 4/11/2023 at 12:00. A 5- day noncompliance letter from Baltimore City was emailed to MDE on 5/24/2023 and a phone call report to MDE Compliance Program regarding the failure to have accurate BOD result for 4/7/2023 was made on 5/24/2023.

With respect to the above MDE authorization the following violations of Environment Article 9 by the Patapsco WWTP were observed on this date, with corrections (in bold text) needed immediately:

1) There are BAF media on the ground and on both bar screens inside the IPI building. BAF media was also observed outdoor on the ground and on the surface of a hopper. A picture of bar screen #2 is shown in Figure 1a. A picture of the BAF media on the ground inside the west side of the IPI building by bar screen #1 is shown in Figure 1b. A picture of the hoppers outdoor by the west side of the IPI building is shown in Figure 1c.

Figure 1a: BAF media on the side of bar screen #2.

Figure 1b: BAF media on the ground by bar screen #1 inside the west side of the IPI building. There are some BAF media on bar screen #1 (pointed to with a red arrow).

Figure 1c: Hoppers outdoor by the west side of the IPI building. BAF media on the surface of the hopper and on the ground.

Remove all BAF media from the aforementioned areas and dispose of them accordingly.

2) Grease track (from the combined influent building) and BAF media were observed on the ground at the road between the transfer station and the combined influent building. A picture of the transfer station is shown in

Figure 2a. Pictures of the grease tracking are shown in Figures 2b and 2c. Pictures of BAF media on the ground are shown in Figures 2d to 2f.

Figure 2a: Grease track at the transfer station facing northwest.

Figure 2b: Grease track and grit on the ground by the transfer station. This location is immediately east of the area shown in Figure 2a, facing northeast.

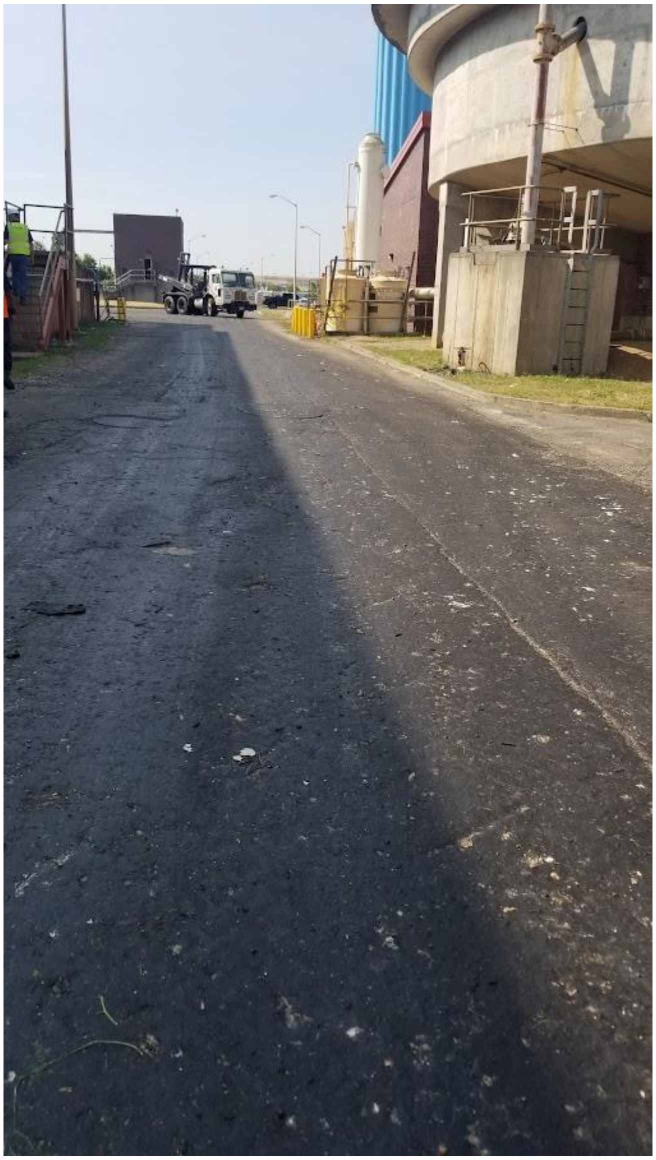


Figure 2c: Grease tracking and grit on the ground at the road west of the combined influent building. This picture was taken facing south.

Figure 2d: View of the northwest side of the combined influent building (location of potential grease and grit from fine screens #1- 4 would be dropped into dumpsters at the output side of the conveyor). There are some media imbedded along the depressed area in the middle of the picture.

Figure 2e: Close up view of Figure 2d with some BAF media in the depressed area by the northwest side of the combined influent building.

Figure 2f: Close up view of BAF media on the ground by the west side of the combined influent building and south of the area shown in Figure 2d.

Remove all BAF media and grit from the ground. Implement better controls to reduce the amount of grease and grit track out from the combined influent building or the transfer station.

3) The GSTs are overloaded with sludge and solids and are not able to function as designed. The function of the GST is to allow for most of the biosolids to be at the bottom of the GST and for a relatively solids-free supernatant to be at the top. Both skimmer arms in GST #1 are above the water surface. Both skimmer arms in GST #2 are partially on the water surface. The high concentrations of biosolids in GST effluent can negatively impact the pure oxygen reactors' ability to remove BOD and can cause nitrification issues within the plant. Pictures of GST #1 are shown in Figures 3a and 3b. Pictures of GST #2 are shown in Figures 3c and 3d.

Figure 3a: Excessive amount of sludge in GST #1. A skimmer arm in GST #1 is above the water surface.

Figure 3b: Sludge outside of the weir in GST # 1.

Figure 3c: Sludge outside of the weir in GST # 2.

Figure 3d: Excessive amount of sludge in GST # 2.

The Patapsco WWTP should operate and process sludge in the GSTs in a manner consistent with the function and design of the equipment. Solids should be removed from the GSTs regularly.

4) BAF media was observed in the concrete outflow pit for Clarifier #1, on the ground by the stairs at Clarifier #1, and on the blue pump by Clarifier # 1. A picture of the outflow pit is shown in Figure 4a. A picture of the BAF media by the staircase at Clarifier #1 is shown in Figure 4b. A picture of the pump is shown in Figure 4c.


Figure 4a: BAF media in an outflow pit by the southwest side of Clarifier #1 facing northeast.

Figure 4b: BAF media on the ground by the stairs leading to the south side of Clarifier #1.

Figure 4c: BAF media on the ground and a pump by the south side of Clarifier #1.

Remove all BAF media from the aforementioned areas and disposed of them accordingly.

5) The secondary clarifiers are not operating as designed. One of the two skimmer arms in Clarifiers # 4, 5A, 5B, and 6B are not functioning as designed. Grass was observed to be growing in Clarifiers # 1, 5A, 6A, and 6B. BAF media was observed outside of and on the launder cover within Clarifier# 6B. Sludge was observed between the launder covers within Clarifier #4. Debris was observed in Clarifiers # 5B and 6A. Trash was observed between two launder covers within Clarifier #5B. Pictures of Clarifier # 1 is shown in Figure 5a. Pictures of Clarifier #4 are shown in Figures 5b and 5c. Pictures of Clarifier #6A are shown in Figures 5d and 5e. Pictures of Clarifier 6B are shown in Figures 5f to 5i. Pictures of Clarifier #5B are shown in Figures 5j to 5l. Figures of Clarifier #5A are shown in Figures 5m and 5n.

Figure 5a: Plants in Clarifier #1, by the V- notch weir

Figure 5b: A section of the skimmer arm in Clarifier #4 is missing.

Figure 5c: Sludge between launder covers within Clarifier #4

Figure 5d: Plant and debris by the launder cover in Clarifier # 6a (pointed to with a red arrow).

Figure 5e: Grass growing by the launder cover within Clarifier #6A.

Figure 5f: The rubber part of the skimmer arm in Clarifier # 6B is not leveled and is partially submerged in water.

Figure 5g: Media on launder cover of Clarifier #6B.

Figure 5h: Media on the ground by Clarifier #6B

Figure 5i: Plant growing by the launder covers in Clarifier # 6B.

Figure 5j: Debris between the launder cover and baffle of Clarifier #5B.

Figure 5k: Close up view of the debris shown in Figure 5j, with debris above the height of the baffle in Clarifier #5B.

Figure 5l: Trash in Clarifier # 5B and a section of the scraper arm is missing.

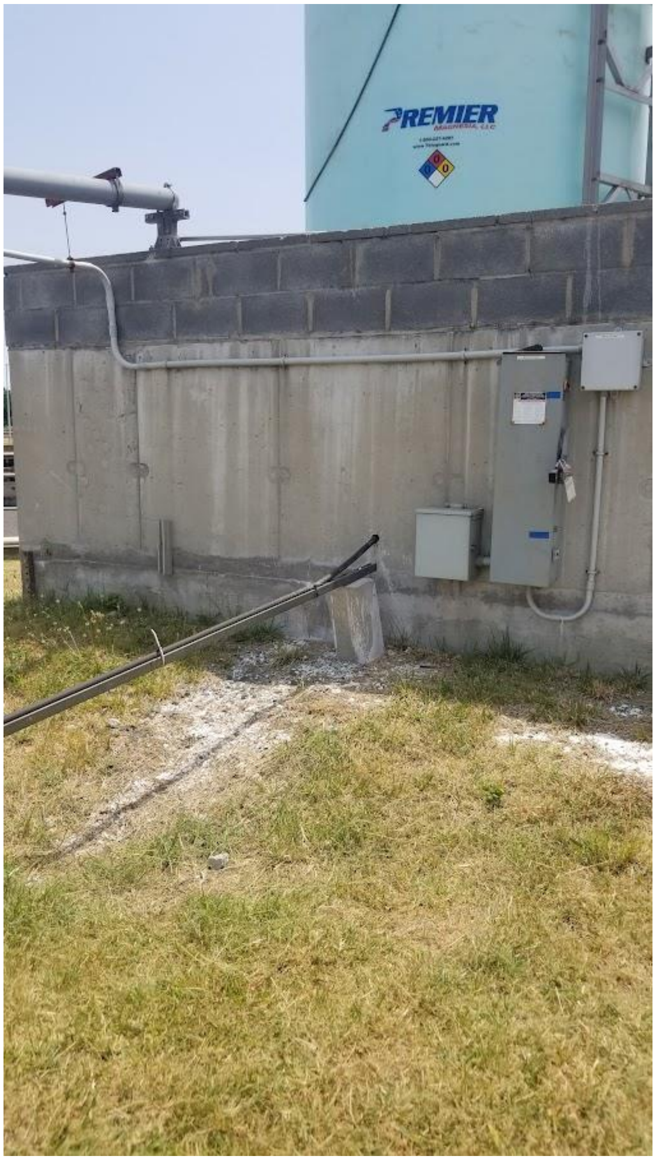
Figure 5m: Plant growing in the middle of Clarifier # 5A (pointed to with a red arrow).

Figure 5n: A skimmer arm partially under water in Clarifier 5A.

Repair and maintain the clarifiers to ensure that they are functioning per design. The skimmer arms should be fixed to ensure that the entire length of the skimmer arms is on the water surface and extending to the baffles, allowing for solids on the water surface to be skimmed into scum troughs.

Remove all vegetation, trash, and BAF media from the clarifiers. Implement routine maintenance to prevent the excessive buildup of sludge and solids in the clarifiers.

6) White powdery material was observed on the ground by an abandoned tank and the northwest side of Clarifier #3. Mr. Chris Saunders identified this white material to be magnesium hydroxide. A picture of the magnesium powder on the ground is shown below:



Remove the soil that is comingled with magnesium hydroxide powder and disposed of the soil accordingly. Replace the contaminated soil with clean soil before stabilizing with seed and straw.

7) Failure to obtain valid BOD lab results for 4/7/2023.

State law provides for penalties for violations of Maryland Environment Article Title 9 for each day the violation continues. The Maryland Department of the Environment may seek penalties for the aforementioned violations of Title 9 on this site for each day the violation continues.

Inspection Date: June 15, 2023
Site Name: Patapsco WWTP
Facility Address: 3501 Asiatic Ave, Curtis Bay, MD 21226

Contact this inspector upon implementation of the requested corrective actions, reasonably necessary to bring this site into compliance. If the corrective actions cannot be completed within the prescribed time frames above, you should continue to advise this inspector at least every 30 days of the status of the measures taken to complete the corrective actions. If you have any questions, needed assistance, or to request a re- inspection, please contact this inspector at wendy.huang@maryland.gov.

Inspector: 7/3/2023
Wendy Huang /Date
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Received by: Neal Jackson 7-5-2023
Signature/Date

Neal Jackson
Print Name